

AN APPARATUS FOR THE PRODUCTION OR
REFINING OF METALS, AND RELATED PROCESSES

ABSTRACT OF THE DISCLOSURE

[0085] An electroslag-cold hearth (ESCH) system for refining or producing a desired metal or metal alloy is described. The system includes at least one cold hearth vessel capable of holding a pool of molten liquid metal and an overlying slag layer, and an ingot mold laterally off-set from the cold hearth. A source of raw material, e.g., a feed electrode, is positioned above the cold hearth, and fed into the molten slag in a refining operation. A flow-over dam separates the ingot mold from the cold hearth, preventing the flow of inclusions and other foreign bodies into the ingot mold. In some instances, a non-consumable electrode provides additional thermal energy to the slag. In the production operation, the metal source can be a salt from which the desired metal can be electrochemically extracted. Related methods for refining or producing metals such as titanium alloys are also described.

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